

Remarks and Arguments

Claims 1-11, 13-28 and 30-36 have been presented for examination. Claims 1-11, 13, 15-18, 30, 32, 35 and 36 have been amended.

Claims 1-11, 13, 17-28, 30 and 34 have been rejected under 35 U.S.C. §103(a) as obvious over U.S. Patent No. 6,397,268 (Cepulis, previously cited) in view of U.S. Patent No 6,542,953 (Porterfield, previously cited.) Applicant's attorney thanks the examiner for her time in a telephone interview conducted on March 24, 2005. During that interview the operation of the present invention in configuring I²C bus systems and the operation of PCI systems during configuration was discussed.

In particular, the present invention is directed to configuring I²C bus systems that uses bus bridges in which each bridge responds to configuration commands sent to its assigned bridge ID which both the examiner and applicant's attorney interpreted as an address. In order to configure this system, the configuration software initially sets the bridge IDs of all bridges to the same initial bridge ID value so that all bridges effectively have the same address. Then, the configuration software repeatedly sends configuration commands to this address. Normally, since all bridges have the same address, all bridges on the same bus level would respond to this command. However, because of the "daisy chain" connections between the bridges at each bus level only one bridge responds. Once that one bridge has been configured, its bridge ID value is changed from the initial value to another value. This change in Bridge ID value causes the daisy chain to enable the next bridge on the bus level. Thus, when the next configuration command is sent to the initial Bridge ID, another bridge on the bus level will respond instead of the bridge just configured. In this manner, by repeatedly sending configuration commands to the initial bridge ID, the entire bus network can be configured.

Both Cepulis and Porterfield relate to PCI bus systems. Although these references disclose improvements to a basic PCI bus system, both references use the basic configuration protocol to configure the PCI bus system. It is well-known that PCI bus systems comprise a set of interconnected busses and each bus has a set of slots into which PCI devices can be plugged. Each PCI device, including PCI-PCI bus

bridges has a unique address in this system in which the address is related to the slot into which the device, or bridge, is plugged.

Thus, a PCI bus system cannot be configured by repeatedly sending configuration commands to the same address as discussed above because doing this would cause the same PCI device to respond. Instead, in accordance with PCI configuration protocol, a PCI bus is scanned by repeatedly generating different addresses, each of which corresponds to a slot on the bus. An attempt is made to read a register at each different address, and, if there is a response, then the device at that address is configured. Then another different address is generated, etc.

The examiner indicated that, in her opinion, the wording “initially setting the bridge ID of all bridges to a same common predetermined bridge ID value..” used in the independent claims, for example, in paragraph (a) of claim 1, is broad enough to encompass a system in which each bridge had a different address and thus the claims read onto the Cepulis/Porterfield combination.

In response, the independent claims have been amended to clearly distinguish them from a PCI system as disclosed in Cepulis and Porterfield.

For example, claim 1 is illustrative. It now recites, in lines 8-11 “selecting an initial bridge ID value” and “initially setting the bridge ID of all bridges to the initial bridge ID value so that all bridges start with the same bridge ID...” As discussed above in a PCI bus system, such as that disclosed in Cepulis/Porterfield, each device, including each PCI-PCI bridge, has a unique address.

Claim 1 also recites, in lines 12-13, “configuring bridges on a hierarchical level so that only one bridge at a time responds to a configuration command sent to the initial bridge ID value...” No such step is necessary in a PCI bus system because at most one device will respond to a given address, since all addresses are unique.

Further claim 1 recites in lines 14-19, “repeatedly sending configuration commands and data to the initial bridge ID value” and “assigning a unique bridge ID different from the initial bridge ID value to each bridge that responds to the configuration commands and data...” No addresses are re-assigned in a PCI bus system because the addresses are determined by the bus and slot to which a PCI device is attached.

Thus, claim 1 recites steps that are not disclosed or suggested by the combination of Cepulis and Porterfield. Consequently, it distinguishes over the combination of the two references.

The remaining independent claims, 18, 35 and 36 have been amended in a parallel fashion to clearly distinguish them from the combination of Cepulis and Porterfield.

Dependent claims 2-11, 13, 17, 19-28, 30 and 34 depend on one of independent claims 1 or 18 and incorporate the limitations thereof. Therefore, they distinguish over the cited combination of references in the same manner as the independent claims. In addition most of the independent claims have been extensively amended in order to conform them to the amendments made to the independent claims.

Claims 14-15 and 31-32 have been rejected as obvious under 35 U.S.C. §103(a) over Cepulis in view of Porterfield and further in view of Story, previously cited. As previously mentioned, the combination of Cepulis, Porterfield and Story does not teach or suggest the limitations recited in claims 14-15 and 31-32. For example, claim 14, which is dependent on claim 13, recites that all bridges on the same hierarchical level are connected in a daisy chain so that only one bridge at a time responds to the initial bride ID value. In Story, the bus bridges are connected in a daisy chain, but not so that only one bridge responds to an address value. Rather the bridges are connected in a daisy chain that passes signals from one bridge to another until the bridge to which the signals are addressed responds. Thus, the combination of Story with Cepulis and Porterfield cannot teach or suggest this limitation because none of the references discloses or suggests it. Claim 15 further recites that the bridge ID must be changes in one bridge before another bridge can respond to the predetermined bridge ID. Story does not disclose this type of operation and neither does Cepulis or Porterfield. Thus claims 14 and 15 patentably distinguish over the cited references. Claims 31 and 32, which contain similar limitations also distinguish over the cited references in the same manner.

Claims 16 and 33 have been rejected as obvious under 35 U.S.C. 103(a) over Cepulis in view of Porterfield and further in view of U.S. Patent Nos. 5,771,387 (Young) and 6,044,207 (Pecone.) The examiner indicates that the Cepulis/Porterfield

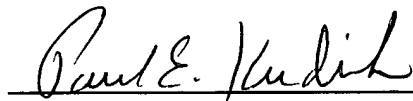
Claims 31 and 32, which contain similar limitations also distinguish over the cited references in the same manner.

Claims 16 and 33 have been rejected as obvious under 35 U.S.C. 103(a) over Cepulis in view of U.S. Patent No. 6,205,147 (Mayo.) The examiner indicates that Cepulis does not disclose a configuration in which two unidirectional bridges are connected in parallel, but Mayo discloses such a combination.

The PCI bus bridges disclosed in Cepulis are clearly bi-directional, thus one skilled in the art would not be motivated to seek additional references that disclose two unidirectional bridges connected in parallel. Further, Mayo is directed to packet-switched networks rather than the parallel PCI busses disclosed in Cepulis. Thus, one skilled in the art would certainly not look to Mayo for combination with Cepulis. Finally, both claims 16 and 33 recite that the two unidirectional bus bridges are assigned different bridge IDs. Neither Cepulis, nor Mayo discloses this limitation and, consequently, neither can the combination of Cepulis with Mayo teach or suggest this limitation. Thus, claims 16 and 33 patentably distinguish over the cited references.

In light of the forgoing amendments and remarks, this application is now believed in condition for allowance and a notice of allowance is earnestly solicited. If the examiner has any further questions regarding this amendment, he is invited to call applicants' attorney at the number listed below. The examiner is hereby authorized to charge any fees or direct any payment under 37 C.F.R. 1.17, 1.16 to Deposit Account number 02-3038.

Respectfully submitted



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